



About a Bee

Year level 4

Curriculum Links

Science

- Science knowledge helps people to understand the effect of their actions (Yr 3, ACSHE051; Yr 4, ACSHE062)
- Living things have life cycles (Yr 4, ACSSU072)
- Living things, including plants and animals, depend on each other and the environment to survive (Yr 4, ACSSU073)

History

- The diversity and longevity of Australia's first peoples and the ways Aboriginal and/or Torres Strait Islander peoples are connected to Country and Place (land, sea, waterways and skies) and the implications for their daily lives (Yr 3, ACHHK060; Yr 4, ACHHK077)

Cross-curriculum priorities

- Aboriginal and Torres Strait Islander histories and cultures

Resources

- Books, websites and other material about bees. See the Resources list on page 62

Location

The classroom

Duration:
45 minutes

Getting started

- Review how fruit forms: the ovules in a flower are pollinated when pollen is transferred from the stamens to the stigma of flowers. Ask the class: How does the pollen get from the stamens to the stigma?
- Bees are one of the many pollinating insects in our garden and for all the fruit and vegetables that are grown across the whole world.

Native and European honey bees in Australia

- In Australia there are over 1500 species of native bees, which are indigenous to the continent. They are more prolific in the north, in warmer climates.
- There are no colony-forming natives in cooler districts, where solitary native bees dig into the earth.
- It is a myth that all native Australian bees do not sting – only 10 of the 1500 species are stingless. They are not aggressive and some of them are too small to sting effectively, but most of them do sting and can sting repeatedly (unlike European honey bees).
- Only a few varieties of native Australian bees store honey in hives, in smaller amounts than European honey bees. This was an important source of food for Indigenous peoples.
- All native bees gather nectar to support their young. Of course this means they pollinate flowers as they forage. An excess of honey is not the only reason for wanting bees in our gardens!

Sugarbags

Native bees, and their honey, have been significant to many Indigenous cultures across Australia. The hives, called 'sugarbags', are celebrated in stories and oral history. You can read the picture book *The Sugarbag*, by Wiradjuri author Nola Turner-Jensen, to your class, and find information on the Sunshine Coast-based Native Bees website (www.nativebees.com.au/gaiya) or you might also ask Elders of the Indigenous cultures in your area.

- European honey bees were imported by early European settlers. In Australia there are three main types of European bees, generally indicating where they were brought from:
 - Caucasian – widely spread, native to Europe, Asia and North Africa
 - Italian – from the Mediterranean area (Italy and Greece)
 - Carniolan – native to the Eastern Mediterranean basin (Slovenia, Croatia, Serbia and Austria)
- In the past there were Germanic bees in Australia. These bees cope well with cold climates in places such as Tasmania, but they are aggressive and now are not common in Australia.

Bringing in bees

Bees arrived in Australia in 1822, on the ship *Isabella*, a convict ship that made several journeys to Australia. The *Isabella* arrived in the colony of New South Wales in March 1822.

Challenge question: Do students think the settlers assumed there would be honey bees already in Australia when they first began settling the continent in 1788?

Begin bee journals

- Students begin a journal or poster about bees, which will provide assessment material for teachers.
- Ask students to explore native bees or European honey bees, depending on your climate and interests. You might ask them to compare the two.
- The first task for the journal is to find out what the three types of bees are in the colony, writing down each type's name, gender, how many there are in the hive, and the job this bee performs.

Type of bee	What gender is it?	How many are there?	What is their role in the hive?
Queen	Female	There is only one. When she dies, worker bees will select a healthy female egg and feed it royal jelly until it grows into a new queen.	The queen is the largest bee and her role is to lay eggs.
Drone	Male	There are about 300 to 3000 drones in a hive.	The drones mate with the queen and then they die.
Worker	Female	There can be 60,000 workers in a hive in summer. In winter there may be only 20,000.	Workers do several jobs including: <ul style="list-style-type: none"> gather nectar and carry it to the hive maintain the hive temperature at a constant 34.4°C, by bringing water for evaporative cooling, or by fluttering their wings to generate heat tend to eggs and young (pupa) feed the queen royal jelly, and tend to her feed the drones make wax make honey cap honey cells.

The relationship in a hive is not just hierarchical, with the queen bee in charge. For example, the size of the comb that the workers build tells the queen what gender of egg to lay – male or female. A wider cell stimulates her to lay a male egg (unfertilised). A smaller cell requires a female egg (fertilised).

If a male bee egg is unfertilised, it means all male bees have grandfathers, but *not* fathers.

Extensions/Variations

- Students find out how long each of these three types of bees lives, and describe the life cycles in their bee journals.
- Students research the types of native bees endemic to their area. They then explore the significance of native bees to the Indigenous cultures of their region.
- Students research the differences in honey production in native versus European honey bees.